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REMARKS

This Response and RCE are offered in reply to the office action of April 27, 2010. A petition and fee for a two (2) month time extension are enclosed, making this response due on September 27, 2010.

The examiner is correct that Applicants' last-filed Response To Office Action inadvertently in error listed claims 1-21 as cancelled since claims 20-21 followed in the listing as being amended. Applicants thank the examiner for noting the inadvertent error and treating it as such in this Office Action.

On page 3 of this office action, claims 20-21 and 26-27 are rejected under 35 USC 102(b) or 103(a) as anticipated by or obvious in view of US 5,139,824.

Claims 20, 26 and 27 have been amended in a manner believed to distinguish over the '824 patent.

In particular, the '824 patent teaches a substrate having different layers deposited one on the other and then subjected to an interdiffusion heat treatment. For example, in one embodiment, the '824 patent provides a transition metal layer on the substrate, then an aluminum and/or aluminide layer on the transition metal layer, and then subjects the layers to interdiffusion. In another embodiment, the '824 patent provides an aluminium and/or aluminide layer on the substrate, then a transition metal layer on the aluminum and/or aluminide layer, and then subjects the layers to interdiffusion.

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In contrast, pending claim 20 recites a coated substrate comprising a superalloy substrate and a chemically vapor as-deposited aluminide diffusion coating on the substrate and comprising co-deposited aluminum and reactive element selected from the group consisting of Hf, Zr, and Y providing a distribution of the reactive element at a coating region of the aluminide diffusion coating or throughout the aluminide diffusion coating.

Pending claim 26 recites a coated substrate comprising a superalloy substrate and an as-deposited aluminide diffusion coating on the substrate and comprising co-deposited aluminum and hafnium providing a distribution of hafnium at a coating region of the aluminide diffusion coating or throughout the aluminide diffusion coating.

Pending claim 27 recites a coated substrate comprising a superalloy substrate and an as-deposited aluminide diffusion coating on the substrate and comprising co-deposited aluminum and zirconium providing a distribution of zirconium at a coating region of the aluminide diffusion coating or throughout the aluminide diffusion coating.

Pending claims 20-21 and 26-27 are not disclosed or suggested by the '824 patent, which teaches away from the pending claims in providing a substrate having different layers deposited one on the other and then subjected to an interdiffusion heat treatment.

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The examiner argues that the '824 patent teaches heat treatment to allegedly interdiffuse a transition metal (listed in the patent) in the coating. However, Applicants point out to the examiner that the metallurgical results achieved by the '824 patent are not so straightforward as the examiner presumes, given that the transition metals listed in the patent are quite disparate and not equivalent to one another, exhibiting quite different metallurgical properties. For example, Hf and Zr have limited solubility in nickel aluminide and Y has little, if any, solubility in nickel aluminide, whereas in contrast platinum and palladium have high solubility therein. Hf, Zr, and Y are prone to form high temperature intermetallic compounds (phases) with strict stoichiometric elemental ratios dramatically decreasing the diffusion across the phase. The '824 patent provides no disclosure or suggestion of Applicants' claimed coated substrate having co-deposited aluminum and reactive element selected from the group consisting of Hf, Zr, and Y to achieve a distribution thereof in the coating or a region thereof.

Moreover, the examiner argues that Applicants' claims do not differentiate the end product from the '824 patent. However, Applicants point out that claim 20 for example recites a coated substrate comprising a superalloy substrate and a chemically vapor as-deposited aluminide diffusion coating comprising co-deposited aluminum and reactive element selected from the group consisting of Hf, Zr, and Y providing a distribution of the reactive element at a coating region of the aluminide diffusion coating or

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throughout the aluminide diffusion coating.

The terminology "as-deposited" and "co-deposited" in claims 20, 26, and 27 are adjectives referring to a condition or state of the aluminide diffusion coating that one skilled in the art will understand and readily distinguish from a layered, interdiffused heat treated coating of the type described in the '824 patent.

Reconsideration of the Section 102(b)/103 rejection of pending claims 20-21 and 26-27 is requested as a result.

On page 4 of the office action, claims 20-21 and 26-27 are rejected under 35 USC 102(e) or 103(a) as anticipated by or obvious in view of US 5,292,594.

Claims 20, 26 and 27 have been amended in a manner believed to distinguish over the '594 patent.

In particular, the '594 patent teaches a substrate having different layers deposited one on the other and then subjected to an interdiffusion heat treatment. For example, in one embodiment, the '594 patent provides a transition metal layer on the substrate, then an aluminum and/or aluminide layer on the transition metal layer, and then subjects the layers to interdiffusion. In another embodiment, the '594 patent provides an aluminium and/or aluminide layer on the substrate, then a transition metal layer on the aluminum and/or aluminide layer, and then subjects the layers to interdiffusion.

In contrast, pending claim 20 recites a coated substrate

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comprising a superalloy substrate and a chemically vapor as-deposited aluminide diffusion coating on the substrate and comprising co-deposited aluminum and reactive element selected from the group consisting of Hf, Zr, and Y providing a distribution of the reactive element at a coating region of the aluminide diffusion coating or throughout the aluminide diffusion coating.

Pending claim 26 recites a coated substrate comprising a superalloy substrate and an as-deposited aluminide diffusion coating on the substrate and comprising co-deposited aluminum and hafnium providing a distribution of hafnium at a coating region of the aluminide diffusion coating or throughout the aluminide diffusion coating.

Pending claim 27 recites a coated substrate comprising a superalloy substrate and an as-deposited aluminide diffusion coating on the substrate and comprising co-deposited aluminum and zirconium providing a distribution of zirconium at a coating region of the aluminide diffusion coating or throughout the aluminide diffusion coating.

The examiner argues that the '594 patent, like the '824 patent, teaches heat treatment to allegedly interdiffuse a transition metal (listed in the patent) in the coating. However, Applicants again point out to the examiner that the metallurgical results achieved by the '594 patent are not so straightforward as the examiner presumes, given that the transition metals listed in the patent are quite disparate and not equivalent to one another, exhibiting quite different metallurgical properties. For example, Hf and Zr have limited solubility in nickel aluminide and Y

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has little, if any, solubility in nickel aluminide, whereas in contrast platinum and palladium have high solubility therein. Hf, Zr, and Y are prone to form high temperature intermetallic compounds (phases) with strict stoichiometric elemental ratios dramatically decreasing the diffusion across the phase. The '594 patent provides no disclosure or suggestion of Applicants' claimed coated substrate having co-deposited aluminum and reactive element selected from the group consisting of Hf, Zr, and Y to achieve a distribution thereof in the coating or a region thereof.

Moreover, the examiner argues that Applicants' claims do not differentiate the end product from the '594 patent. However, Applicants point out that claim 20 for example recites a coated substrate comprising a superalloy substrate and a chemically vapor as-deposited aluminide diffusion coating comprising co-deposited aluminum and reactive element selected from the group consisting of Hf, Zr, and Y providing a distribution of the reactive element at a coating region of the aluminide diffusion coating or throughout the aluminide diffusion coating.

The terminology "as-deposited" and "co-deposited" in claims 20, 26, and 27 are adjectives referring to a condition or state of the aluminide diffusion coating that one skilled in the art will understand and readily distinguish from a layered, interdiffused heat treated coating of the type described in the '594 patent.

Pending claims 20-21 and 26-27 are not disclosed or suggested by the '594 patent.

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Reconsideration of the Section 102(e)/103 rejection of pending claims 20-21 and 26-27 is requested as a result.

Allowance of the pending claims is requested.

Applicants have added new claims 28, 29, and 30, which are believed to be allowable as well.

The Commissioner is authorized to charge any fee for new claims 28-30 to my deposit account No. 20-1124, although no fee is believed to be due.

The examiner is invited to note that Applicants previously filed a Change of Correspondence Address for this application and that this office action was mailed to an old address. Applicants request that the next office action be mailed to the new correspondence address shown below and of record in the PTO for this application.

Respectfully submitted,



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